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the Society, it was conceived by the Committee, to whom the investigation of the subject was committed, that, although they had no reason whatever to question the correctness of Mr. Carey's statement, the public would be better satisfied to have the particulars of this very interesting and important experiment substantiated by the attestation of Mr. Williams. But Mr. W. was not a resident at New York; and although Mr. Carey inserted an advertisement in the New York newspapers, as also did J. A. Yates, Esq. of Liverpool, on the part of the Society, in the newspapers both of New York and Boston, nothing could be heard of Mr. Williams till Mr. Carey learnt, some time after, that Mr. W. had died in the West Indies three years before.*

No. III.

BONE GLUE.

Mr. WALTER MACQUEEN, 8, Marine Street, Brighton, communicated to the Society a sample of Bone Glue, prepared by him in the following manner.

THE bone, previously deprived of its fat by boiling, is to be macerated in muriatic acid, diluted with twice its bulk of cold water. When the phosphate and carbonate of

* It is understood that the Navy Board at present have the spaces between the timbers in men-of-war filled with a mixture of chalk, oil, and Stockholm tar, injected into the bottom of the frame by means of a forcing pump.

lime have been thus removed, a mass of gelatinous fibre remains, which is to be repeatedly washed in warm water till the whole of the acid is got rid of. It is then to be put into a covered digester, with a proper quantity of water, and is to be kept at a heat not exceeding 200° F. without stirring till the solution is completed. The thick liquor is then to be poured into a box and allowed to grow cold, when it will be found to have acquired the consistence of a stiff jelly, and is to be cut into cakes and dried in the usual manner. Five pounds of bone and five pounds of muriatic acid yield one pound of glue, of an orange-yellow colour, dry, hard, brittle, and of less specific gravity than glue from skin.

Part of the specimen sent by Mr. Macqueen was put into the hands of the carpenter usually employed by the Society, who reported that he took equal weights of bone glue and of the best London-made glue, and soaked them for a night in water; they were then put into separate pots, were just covered with water, and were boiled. The bone glue was quite thin and did not require more water; the other boiled thick, and it was necessary to add more water, in order to bring it to a state fit for use. The solution of bone glue was found to *chill*, *i. e.* to become gelatinous, much sooner than the other; and is, therefore, not applicable to cementing long joints, but answers very well for small work. It is also well adapted for laying veneers, being stronger than common glue, making a closer joint, and not being liable to be affected by damp.

The Committee directed the Secretary to make some comparative experiments, which was accordingly done, with the following result:—

Two varieties of London glue were taken.

No. 1. Common glue, of a yellowish-brown colour,

somewhat flexible, and with an odour like that of stale liquid glue.

No. 2. Best London glue, of a darker colour than the preceding, hard, brittle, inodorous.

No. 3. Mr. Macqueen's bone glue.

Two hundred grains of each were put into separate equal coffee cups, with two liquid ounces of river water.

On the second day :—

No. 1. Has swelled the least, and has a putrid odour.

No. 2. Has swelled the most, and is inodorous.

No. 3. Has swelled nearly as much as No. 2, and is also inodorous.

On the third day :—

No. 1. Is less swelled than the others, much of the water remaining unabsorbed, and its odour is very putrid.

No. 2. Has absorbed nearly the whole of the water, and is inodorous.

No. 3. Is in the same state as No. 2.

Each cup was put over the fire in a vessel of cold water, and by the time that the water began to boil, each of the glues was perfectly dissolved. No. 2 made the thickest solution. No. 1 was thinner. No. 3 was almost as thin as water.

The water lost by evaporation since the beginning of the experiment was, in No. 1, 125 grs.; in No. 2, 124 grs.; in No. 3, 78 grs. The real proportions, therefore, of glue and of water, in the respective solutions, were—

No.	Glue.	Water.
1	1	: 8·35
2	1	: 8·36
3	1	: 8·82

On cooling, all the three solutions became gelatinous

nearly at the same time. No. 1 was an imperfect tremulous jelly. No. 2 was less tremulous. No. 3 considerably stiffer than No. 2.

The glues thus prepared were put into the hands of the same carpenter as made the former trials.

At a subsequent meeting of the Committee, three pieces of mahogany were produced (each composed of two pieces), cemented by the three samples of glue. The carpenter reported, that all the solutions were thinner than glue as usually prepared; that No. 3 was by far the thinnest, and, if used quickly, before it had time to chill, a smaller quantity of it than of the others was required; and that it made rather a firmer joint. He also stated that in laying veneers, and in certain kinds of cabinet-work, the bone glue may be used with great advantage, because, from the extraordinary fluidity of its solution, a glue might be prepared containing twice the proportion of solid jelly that is contained in other liquid glues, and yet remain quite fluid enough for use. Such a glue would, in many cases, be of great advantage, where extraordinary strength is required.

Of the three specimens of mahogany:—

No. 1 broke altogether in the joint, and is, therefore, decidedly the weakest.

Nos. 2 and 3 broke partly in the joint, but chiefly in the wood; and there does not appear to be much difference between them.